

# Anthrax

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*Disease Fact Sheet Series*

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## What is anthrax?

Anthrax is an acute infectious disease caused by a bacterium called *Bacillus anthracis*. Anthrax most commonly occurs in livestock, but can also infect humans.

## How common is anthrax and who can get it?

Anthrax is most common in agricultural regions where it occurs in animals. Although anthrax can be found globally, it is more often a risk in countries with less standardized and effective public health and animal health programs. Areas currently listed as high risk are South and Central America, Southern and Eastern Europe, Asia, Africa, the Caribbean, and the Middle East. When anthrax affects humans, it is usually due to an occupational exposure to infected animals or their products. Workers who are exposed to dead animals and animal products (industrial anthrax) from other countries where anthrax is more common may become infected with *B. anthracis*. Anthrax in animals rarely occurs in the United States and consequently human anthrax is rare here.

## How is anthrax transmitted?

Anthrax infection can occur in three forms: cutaneous (skin), inhalation, and gastrointestinal. Spores of the bacterium *B. anthracis* can live in the soil for many years, and livestock can become infected by grazing on contaminated pasture. Humans can become infected with anthrax by handling infected animals or animal products or by inhaling anthrax spores from contaminated animal products. Anthrax can also be spread by eating undercooked meat from infected animals.

## What are the symptoms of anthrax?

Symptoms of disease vary depending on how the disease was contracted, but symptoms usually occur within seven days.

**Cutaneous:** Most anthrax infections occur when the bacterium enters a cut or abrasion on the skin, such as when handling contaminated wool, hides, leather or hair products (especially goat hair) of infected animals. Skin infection begins as a raised itchy bump that resembles an insect bite but within 1-2 days the lesion will blister and then develop into a painless ulcer, usually 1-3 cm in diameter, with a characteristic black necrotic (dying) area in the center. Lymph glands in the adjacent area may swell. About 20% of untreated cases of cutaneous anthrax are fatal. Deaths are rare with appropriate antimicrobial therapy.

**Inhalation:** Initial symptoms may resemble a common cold. After several days, the symptoms may progress to severe breathing problems and shock. Inhalation anthrax usually results in death in 1-2 days after onset of the acute symptoms.

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**Intestinal:** The intestinal disease form of anthrax may follow the consumption of contaminated meat and is characterized by an acute inflammation of the intestinal tract. Initial signs of nausea, loss of appetite, vomiting, fever are followed by abdominal pain, vomiting of blood, and severe diarrhea. Intestinal anthrax results in death in 25% to 60% of cases.

### **Can anthrax be spread from person-to-person?**

Direct person-to-person spread of anthrax most likely does not occur.

### **How is anthrax diagnosed?**

Anthrax is diagnosed by isolating *B. anthracis* from the blood, skin lesions, or respiratory secretions or by measuring specific antibodies in the blood of suspected cases.

### **What is the treatment for anthrax?**

Doctors can prescribe effective antibiotics. Usually penicillin is preferred, but erythromycin, tetracycline, or chloramphenicol can also be used. To be effective, treatment should be initiated early. If left untreated, the disease can be fatal.

### **Is there an anthrax vaccine for humans?**

There is currently one anthrax vaccine for humans licensed for use in the United States. Because anthrax is considered to be a potential agent for use in biological warfare, the Department of Defense recently announced that it will begin systematic vaccination of all U.S. military personnel. Among civilians, anthrax vaccine is recommended for individuals who come in contact in the workplace with imported animal hides, furs, bonemeal, wool, animal hair (especially goat hair), and bristles; and for individuals engaged in diagnostic or investigational activities which may bring them into contact with anthrax spores. The vaccine should only be administered to healthy men and women from 18 to 65 years of age. Because it is not known whether the anthrax vaccine can cause fetal harm, pregnant women should not be vaccinated. The vaccine is reported to be 93% effective in protecting against cutaneous anthrax. Anthrax vaccines intended for use in animals should not be used in humans.

### **What is the protocol for anthrax vaccination?**

The immunization consists of three subcutaneous injections given two weeks apart followed by three additional subcutaneous injections given at 6, 12, and 18 months. Annual booster injections of the vaccine are required to maintain immunity.

### **Are there adverse reactions to the anthrax vaccine?**

Mild local reactions occur in 30% of recipients and consist of slight tenderness and redness at the injection site. A moderate local reaction can occur if the vaccine is given to anyone with a past history of anthrax infection. Severe local reactions are very infrequent and consist of extensive swelling of the forearm in addition to the local reaction. Systemic reactions occur in fewer than 0.2% of recipients and are characterized by flu-like symptoms.